ABSTRACT OF THE DISCLOSURE

The present invention reveals a method for enzymatically inactivating a target DNA, a method for detecting conformational change in a nucleic acid, and a method for detecting the presence of a target DNA molecule. The method for enzymatically inactivating a target DNA involves preparing a plasmid, phage, virus, or any other delivery vehicle such as a liposome containing a gene encoding a nuclease. The delivery vehicle is then delivered into cells. The cells are induced to produce the nuclease and the target DNA is then enzymatically inactivated. Alternatively, the nuclease protein is delivered directly to cells and used to enzymatically inactivate the target DNA. The method for detecting conformational change in a nucleic acid requires contacting a nucleic acid with a hybrid restriction nuclease, determining whether the hybrid restriction nuclease has interacted with the nucleic acid, and detecting the conformational change in the nucleic acid. The method for detecting the presence of a target DNA entails contacting a target DNA with a fusion protein, comprising a DNA binding protein joined to a detection domain such as the constant region of an immunoglogulin heavy chain molecule.